International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 10 Issue: 04 | April - 2026 SJIF Rating: 8.659 ISSN: 2582-3930

Temple and Pilgrimage Crowd Management System

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ABSTRACT - The increasing number of devotees visiting temples and pilgrimage sites has made crowd management a critical challenge for authorities. Traditional manual systems often lead to long waiting queues, overcrowding, lack of transparency, and potential safety risks such as stampedes. To address these issues, this project presents a Temple and Pilgrimage Crowd Management System, developed using PHP (Laravel framework) and MySQL as the backend technologies. The proposed system is a web-based application that enables devotees to book darshan slots online in advance, thereby reducing physical queues and ensuring a controlled flow of visitors. The system provides functionalities such as user registration, secure login, slot-based booking, package selection, and booking confirmation. An administrative module is also included, allowing temple authorities to manage bookings, control slot availability, and monitor crowd distribution effectively.

Keywords: *Crowd management, MySQL, Management system, PHP Laravel, DBMS, Pilgrimage, Temples.*

1. INTRODUCTION:

With the acceleration of urbanization, fights and stampedes caused by crowd gathering have occurred from time to time in large shopping malls, stations, entertainment places, etc., which bring great difficulties to urban security and management. n current decades, human population in the world is increasing dramatically. This growth, as a result from movement and urbanization worldwide, has indirectly made crowd phenomenon increasing. Large gatherings of people can be observed at covered areas such as in Pilgrimage sites, Temples, building halls, airports and stadiums as well as in open areas like at walkways, parks, sport events and public demonstrations. The purpose of the gatherings has important effect on the large-scale properties and behaviours of the crowd. Therefore the analysis of crowd dynamics and behaviours is a subject of great interest in many scientific researches in psychology, sociology, public services, safety and computer vision.[1][2]

Temples and pilgrimage sites attract a large number of devotees every day, especially during festivals, special occasions, and weekends. Managing such large crowds becomes a challenging task for temple authorities. Traditional systems rely heavily on manual processes, which often lead to inefficiencies, confusion, and safety risks. Devotees typically have to stand in long queues for hours to get darshan (worship). In many cases, there is no proper system to estimate waiting time or control the number of people entering the temple premises at a given time. This results in overcrowding, discomfort, and sometimes even dangerous situations such as stampedes. With the advancement of technology and the increasing use of the internet, there is a growing need to shift from manual crowd management to a more efficient digital system. An online Temple and Pilgrimage Crowd Management System can help streamline the process, reduce congestion, and enhance the overall experience for devotees.

2. LITERARY SURVEY:

Crowd detection and monitoring form the foundation of any crowd management system. Modern systems use cameras, sensors, and data analytics to estimate crowd density and movement. A comprehensive review shows that improper crowd monitoring can result in disasters, and hence advanced technologies are required for identification, counting, and behaviour analysis of crowds.

Computer vision-based approaches, especially deep learning models, are widely used for crowd counting and anomaly detection. Recent research proposes systems that use overhead cameras and deep learning models (such as SSD and CNN) to detect and count people in real time. These systems capture video data and process it using trained models to estimate crowd density and movement patterns [3].

The Internet of Things (IoT) plays a significant role in modern crowd management systems by enabling real-time data collection and communication between devices. An intelligent IoT-based system has been proposed for managing large crowds during pilgrimage events such as Hajj. This system uses sensors, RFID tags, and cloud infrastructure to monitor crowd movement, predict congestion, and guide people through safe paths [4][5].

Queue management systems are widely used in banks, hospitals, and public service centers to reduce waiting time and improve service efficiency. Traditional queue systems are being replaced by digital solutions that use virtual queues, token systems, and online booking. These systems allow users to book services in advance and receive notifications, thereby eliminating long physical queues. Queue management is essential in crowd control, as it helps regulate the flow of people and reduces congestion. Studies in operations research emphasize that efficient queue systems improve fairness, reduce waiting time, and enhance user satisfaction. [6][7]

Wireless technologies such as Wi-Fi and sensor networks are also used for crowd detection without requiring direct human interaction. Studies show that Wi-Fi-enabled IoT devices can estimate crowd size by analyzing signal patterns, eliminating the need for additional hardware or user participation. Similarly, Wireless Sensor Networks (WSN) are used to detect and monitor crowd movement, especially in resource-constrained environments. These systems are cost-effective and suitable for developing regions [8].

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3. PROPOSED SYSTEM:

To address the problems identified in the previous chapter, a Temple and Pilgrimage Crowd Management System is proposed. This system is designed to provide an efficient and organized way of managing temple visits using digital technology. The system allows devotees to book darshan slots online, select packages, and receive confirmation, while enabling administrators to manage bookings and control crowd flow effectively.

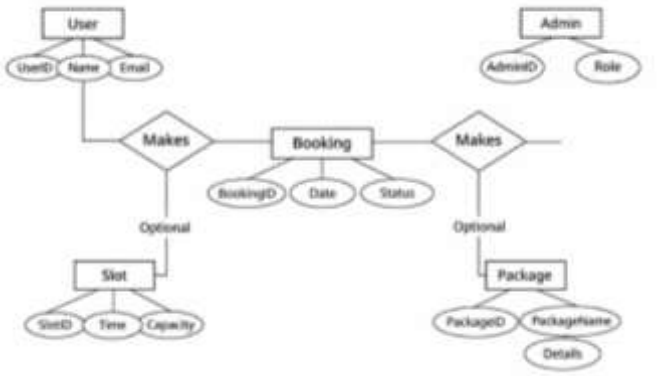


Fig -1: Entity-Relationship Diagram (ERD)

Features of the Proposed System:

1. Online Slot Booking Devotees - can book their darshan slots in advance through the system. They can select a convenient date and time slot based on availability.
2. Devotee Registration - Users must register in the system to access booking services. Features consists of User account creation, Secure login and authentication, Storage of user details.
3. Package Selection - The system allows devotees to select different types of packages or services offered by the temple.
4. Admin Management System - The admin module allows temple authorities to manage the entire system efficiently. Few instances of the Function are; View and manage bookings; Add, update or delete packages; Monitor number of devotees; Control slot availability.
5. Booking Confirmation – In the Crowd Management System, after selecting a slot and package, the system generates a booking confirmation.

4. SYSTEM ARCHITECTURE:

This project follows a web-based multi-tier architecture using the MVC (Model-View-Controller) pattern implemented through Laravel.

This system architecture efficiently manages user interactions and slot allocation through a structured, multi-layered approach. At the initial stage, the *Devotee/User* interacts with the system via a *Web Interface/Frontend*, which serves as the primary access point. This frontend is developed using modern web technologies (such as HTML, CSS, JavaScript, and frameworks like React or Angular) to provide a responsive and user-friendly interface. It handles user inputs, authentication, and request submission, which are then transmitted to the backend *Slot Management System* through secure API calls.

The *Slot Management System* acts as the core processing unit of the architecture, responsible for handling business logic, including slot availability checks, booking confirmation, scheduling, and conflict resolution. It ensures that slots are allocated efficiently based on predefined rules such as time constraints, capacity limits, and priority handling. This system communicates directly with the *Database (MySQL)*, where all persistent data—including user details, booking records, slot timings, and system logs—are stored and managed. The database layer ensures data integrity, consistency, and quick retrieval through optimized queries and indexing techniques.

Additionally, an *Admin Dashboard* is integrated into the architecture to provide administrative control and monitoring capabilities. Through this dashboard, administrators can manage slot configurations, monitor booking activities, update schedules, and handle exceptions or cancellations. The dashboard communicates directly with the Slot Management System, enabling real-time updates and centralized control over the entire process. Overall, this architecture ensures scalability, reliability, and efficient resource utilization while maintaining a seamless user experience and robust backend management suitable for large-scale deployment in crowd or event management scenarios.

The system uses a 3-tier architecture:

a) Presentation Layer (Frontend)

This layer represents the platform where the user interacts with the website it is built using HTML, CSS, JavaScript. It provides user interface for - Devotees (users) and Admin (temple authorities). While handling - User inputs (booking, login, registration), Display of slots, packages and confirmations. This layer interacts with the backend via HTTP requests.

b) Application Layer (Backend / Server)

This layer is developed using PHP (Laravel Framework). While it acts as the brain of the system

It Handles:

-Business logic

-Request processing

-Authentication & authorization

-Slot allocation logic

-Booking management

c) Data Layer (Database)

The Database layer as the name suggests, handles the dataset of Users and Admins. Provides centralized data management for the entire system. It Uses MySQL Database to Store all system data such as:

-User details

-Booking records

-Slot information

-Package details

-Admin data

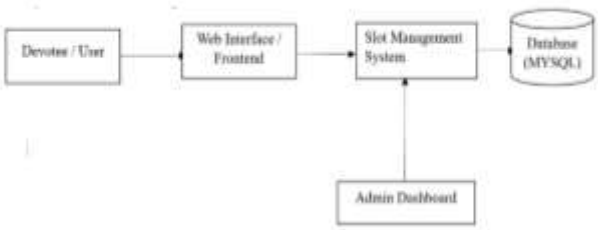


Fig -2: System Architecture Diagram

6. IMPLEMTATION:

The system is designed to facilitate the management and booking of Darshan slots, involving interactions between devotees/users, admins, and a database system. Initially,

a devotee or user interacts with the system to book a Darshan slot through the "Book Darshan Slot" process. This process captures the booking details and updates the Users/Bookings/Slots database with relevant information, ensuring all bookings are recorded and tracked systematically. Simultaneously, the system provides the admin with management capabilities through the "Admin Management" process, enabling the admin to oversee and control bookings, users, and available slots. The admin interface interacts directly with the Users/Bookings/Slots database to modify or verify records as necessary. Moreover, the admin can send confirmations or notifications back to the devotee/user, ensuring effective communication and confirmation of slot bookings. This bidirectional communication between users and admin ensures that the process flow remains transparent and efficient, providing confirmations and updates promptly. Overall, this structured approach integrates user requests, administrative control, and data management to streamline the Darshan slot booking process, promoting organized, user-friendly, and maintainable system operations.

Fig -3: Data Flow Diagram (DFD)

Let us take a look at the visuals of the actual webpage and its various features:

I.Home page:

II.Enquiry Form:

III.Search page:

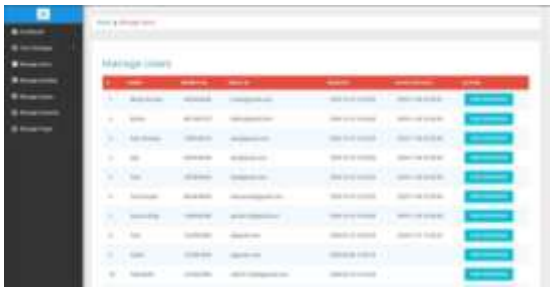
IV.Update data page:

V.Manage Enquiries page:

VI.Manage Issues page:

VII.Manage Bookings page:

VIII.Manage Users page:



IX.Manage packages page:

X.Dashboard page:

XI.About us:

XII.Terms and Condition page:

XIII.Privacy policy page:

7. CONCLUSION:

The Temple and Pilgrimage Crowd Management System provides an effective digital solution for managing large numbers of devotees using modern web technologies. The system is developed using HTML, CSS, and JavaScript for the frontend, and PHP (Laravel framework) with MySQL database for backend processing and data management. It implements key functionalities such as online booking, slot allocation, user registration, and queue management, which help in regulating the flow of devotees in an organized manner. By replacing traditional manual systems with a digital reservation system, the application significantly reduces waiting time, avoids overcrowding, and improves overall safety and efficiency.

The system ensures data consistency, real-time updates, and secure user handling, making it reliable for practical deployment. Additionally, the modular design makes it scalable and flexible, allowing future enhancements such as mobile application integration, real-time crowd monitoring, and AI-based prediction systems.

8. REFERENCES:

[1] D. Zhang, J. Wang, and X. Li, "Crowd density estimation using surveillance systems," IEEE Transactions on Intelligent Transportation Systems, vol. 14, no. 3, pp. 1203–1212, Sep. 2013.

[2] D. Helbing and A. Johansson, "Pedestrian, crowd and evacuation dynamics," Encyclopedia of Complexity and Systems Science, Springer, 2010.

[3] R. Singh, P. Kumar, and S. Sharma, "Analysis of crowd management in mass gatherings in India," in Proc. IEEE Int. Conf. Smart Cities, 2018, pp. 45–50.

[4] J. Gubbi, R. Buyya, S. Marusic, and M. Palaniswami, "Internet of Things (IoT): A vision, architectural elements, and future directions," Future Generation Computer Systems, vol. 29, no. 7, pp. 1645–1660, Sep. 2013.

[5] Y. Li, X. Zhang, and D. Chen, "CSRNet: Dilated convolutional neural networks for crowd counting," in Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR), 2018, pp. 1090–1098.

[6] A. Botta, W. de Donato, V. Persico, and A. Pescapé, "Integration of cloud computing and Internet of Things: A survey," Future Generation Computer Systems, vol. 56, pp. 684–700, Mar. 2016.

[7] R. Kitchin, "The real-time city? Big data and smart urbanism," GeoJournal, vol. 79, no. 1, pp. 1–14, Feb. 2014.

[8] V. Sharma and A. Gupta, "Smart crowd management system using IoT," in Proc. IEEE Int. Conf. Advanced Computing and Communication Systems (ICACCS), 2019, pp. 1–5.

[9] R. C. Larson, "Perspectives on queues: Social justice and the psychology of queueing," Operations Research, vol. 35, no. 6, pp. 895–905, Nov.–Dec. 1987.

[10] J. Zhou, L. Chen, and Z. Chen, "Mobile crowd management for smart cities," IEEE Communications Magazine, vol. 55, no. 1, pp. 102–109, Jan. 2017.3. van Leeuwen, J. (ed.): Computer Science Today. Recent Trends and Developments. Lecture Notes in Computer Science, Vol. 1000. Springer-Verlag, Berlin Heidelberg New York (1995)